REPORT

TO THE

Councils of Philadelphia

ON SOME OF

THE INSECTS

INJURIOUS TO OUR

SHADE TREES.

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PHILADELPHIA.

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REPORT.

To the Select Council of Philadelphia.

GENTLEMEN:—You have done me the honor to invite me to give the Councils of the City such information as I may possess in regard to the insects which injure our shade trees.

I shall be most happy to communicate to our respected Councils any knowledge I may have on this or other subjects, which may be considered to be of utility to my fellow-citizens.

The shade trees of the City contribute to its beauty, its health, and apparent cleanliness: and no reasoable pains nor expense should be spared to preserve them. The Silver Maple is cultivated too much to the exclusion of other trees, as it is one of the most liable to the depredations of insects. The Sugar Maple, Red Maple, Sycamore, Horse Chestnut, American Linden, Silver Poplar, &c., should be more frequently employed. The Ailanthus, notwithstanding its offensive odor during the flowering season, is an important shade tree, on account of its comparative freedom from the attack of insects. Introduced here and there to break the series of maples along the streets, it would tend to retard the distri-

bution, and in a measure to restrict the ravages of the canker worm and other insects.

Naturally, birds are most important agents in preventing an undue increase of insect life. In cities the conditions in general are unfavorable to their existence, though to a limited extent they might be induced to take up their abode with us. A friend who has devoted much observation to their habits, informs me that the want of easy and undisturbed access to water, in some degree, prevents them from living in our public squares. To remedy the defect, he proposes to introduce into the latter, in convenient positions, shallow basins supplied with water from a hydrant, the whole to be enclosed in groups of shrubbery. This is an excellent suggestion, easy of accomplishment, and worthy of trial. The groups of shrubbery would present an additional advantage,—by breaking the monotony, and restricting the view of even grounds, they would enhance the beauty and increase the apparent extent of the squares.

The squirrels have been accused of indirectly favoring the increase of insects by driving away birds. This is a mistake, as the canker worms were just as bad upon the Lindens, before the introduction of the squirrels into the squares, as they are now upon the Maples.

As a general measure to moderate the depredation of insects, I would recommend an occasional examination of the trees. The trunks and larger branches should be swept with a stiff brush, so as to remove adherent insects, cocoons and eggs. Places on the trunk, where the bark has been destroyed and the wood exposed, form convenient concealment to insects

and should be cleaned. The surroundings of the trees also, as the tree-boxes, fences, &c., should be swept, and the collected debris should be destroyed. Dead and curled-up leaves, often spun together with the webs of insects, should be shaken from the trees by means of poles.

I would further recommend the introduction into our public squares, of a few turkeys, guinea fowls, and chickens, which destroy all insects that come within their reach.

The more destructive insects of our shade trees, which I have noticed, are the canker-worm, the scale-bug, the tufted caterpillar, the sack-bearer, and the borer.

1. The common canker-worm, span-worm, or measurer, I apprehend will prove to be a nuisance difficult to remove. The insect belongs to the same family as the canker-worms, which have proved very destructive to fruit and shade trees in New England, but it is a member of a different genus. It is figured by the German entomologist, Hübner, under the name of *Endalimia subsignaria*. The young worms appear shortly after the putting forth of the leaves of the silver maple, which appears to be the favorite food of the insect, though it does not despise other trees. The worms grow until about the middle of June, when they enclose themselves in a case or cocoon of coarse lace-work, which they construct among the debris of the leaves which served them as food, at the ends of the branches, or in the interstices of the bark on the trunk, or upon the tree-boxes, neighboring railings, fences, &c. Within the cocoons, the worms undergo transformation into a greyish pupa, about half an inch in length. The pupa remains quiescent until the end of June or the

beginning of July, when a white moth or miller emerges, which may be seen in the dusk of the evening, flickering actively among the boughs of the trees. The female deposits her eggs, which, at first, are of a green color, but subsequently assume an olive brown hue, in patches on the limbs and twigs, where they remain until the succeeding spring, to furnish new colonies of worms.

Of the many canker-worms produced, the greater number are destroyed in various ways. Cold weather and rains kill a great many. As they let themselves down by a silken thread, upon any slight disturbance many fall to the ground and are liable to be crushed. They suffer most, however, from the attack of several species of Ichneumon. This is a genus of active, wasp-like insects, which pierce the canker-worms and deposit in their interior an egg. From the latter is hatched a maggot, which feeds on the internal parts of the canker-worms. Many of these survive the pupa condition, but instead of the moth there emerges a bright Ichneumon, ready to pursue the career of its parent in destroying noxious insects.

In regard to the means of destroying our canker-worm, several of those which have been resorted to for the destruction of others of the family, will prove equally effectual. Infusion of tobacco stems, or a solution of whale oil soap squirted on the trees, will kill the worms without injuring the foliage, especially in May, while the worms are young and tender. As these articles may be too expensive for general application, it would be worth while to try a weak solution of a mineral poison, as I have been informed by an acquaint-

ance, that in this manner he succeeded in getting rid of the insects upon his trees without injuring the foliage in the slightest degree.

Shaking the boughs with a pole, will dislodge many of the worms, which then let themselves down by a thread, when they may be knocked off and crushed. Or they may be prevented from regaining their position among the foliage by means of a tar collar or an oil-trough collar encircling the trunk.

After the worms have passed into the pupa condition, the webs and debris of leaves spun together and often concealing many insects, should be shaken from the trees, collected together and destroyed. During this period also, from about the second week to the end of June, the trunks of the trees and the neighboring tree-boxes, railings and fences, should be industriously cleaned of all adherent cocoons, pupæ, and webs, and the material collected should be burned or scalded. Turkies, guinea fowls and chickens, are very useful in destroying insects. They not only eat the canker-worms, but search industriously after their pupæ and moths. A few of these fowl introduced into the public squares would prove of great service. Even the squirrels would be useful by disturbing and dislodging the worms, and thus bring them within reach of the fowls.

2. The scale-bug, *Coccus aceris*, though not a nuisance like the canker-worm is, nevertheless, an injurious insect to the silver maple. It belongs to the same genus as the cochineal, so well known for its valuable red coloring matter. The scale-insects are conspicuously noticed, in May and June,

adherent to the under sides of the branches of the maples, as white masses about the size of peas, each surmounted with a brown scale. The latter is the female, with her proboscis inserted into the bark, and her abdomen tilted up by a mass of eggs enveloped in a cottony substance. The young emerge from the eggs during the summer and wander among the branches. They finally fix themselves upon the latter, insert their proboscis through the bark, and thus remain without changing their position until the following year, when they develope the masses of eggs as above mentioned. When numerous, these insects exhaust the tree, by depriving it of its juices. They are readily removed by means of a stiff brush attached to a pole. This should be done in May or June, and is easily accomplished, for the insects congregate mainly on the under sides of the larger branches, where they can be readily reached.

3. The tufted caterpillar or vaporer-moth, belonging to the genus *Orgyia*, is observed on most shade trees, fruit trees, and rose-bushes during the summer months. The caterpillar is yellow and hairy, with two long black pencils diverging from the first ring back of the head, and a single brownish pencil projecting from the eleventh ring. The fourth to the seventh rings are furnished on the back, each with a short dense yellow tuft. The head is red, and there are two bright red spots on the ninth and tenth rings.

This caterpillar formerly proved quite destructive to the foliage of many of our shade trees, but in latter years its numbers have been comparatively small. After reaching its full growth, it descends upon the trunk, where it remains, or

it proceeds to some neighboring fence, tree-box, &c., and constructs its cocoon. This it does by detaching the hairs of its body and spinning them together with silk. The moth escapes from the cocoon in about ten days or two weeks. The female is wingless, and lays her eggs upon her cocoon, protecting them with a white frothy substance.

The cocoons of this insect, observed in the crevices of the bark, or on neighboring fences, walls, railings, tree-boxes, &c., should be brushed off and crushed. This may be done any time after midsummer.

4. The sack-bearer, drop-worm, or basket-worm, a species of *Oiketicus*, is among the most curious of insects. It is common on our shade trees, but especially infests the maples, larches, and arbor-vitæ. Just at this period, July, the writer observes a large number on the cypress trees in front of the United States Mint, in Chestnut street.

The worms after escaping from the eggs, immediately compose for themselves cases composed of silk, interwoven with fragments of their food, resembling in this respect, the Tineans or carpet and clothes-moths. As the worms grow, they enlarge their silken and leafy habitations, until they reach an inch or two in length. In the latter part of summer, these insects are often noticed dangling from the trees of our side-walks, suspended from the boughs by a silken thread, and enclosed in a dark, rough, spindle-shaped sack. They never leave the latter, but when they have reached their full growth, they fasten their silken case securely to a branch of the tree, and within it undergo transformation into a pupa. From the latter is produced the moth, the male of